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Citrus Insect Control For June, 1956

Long And Costly Fight On Medfly Predicted By Experts

Relationship Of Yield To Age Of Citrus Trees And Trees Per Acre

Citrus Commission Plans Big Summer Advertising

Florida Orange Exports Attract World Attention Part II

Handling And Packaging Trends In Fresh Fruit Operations

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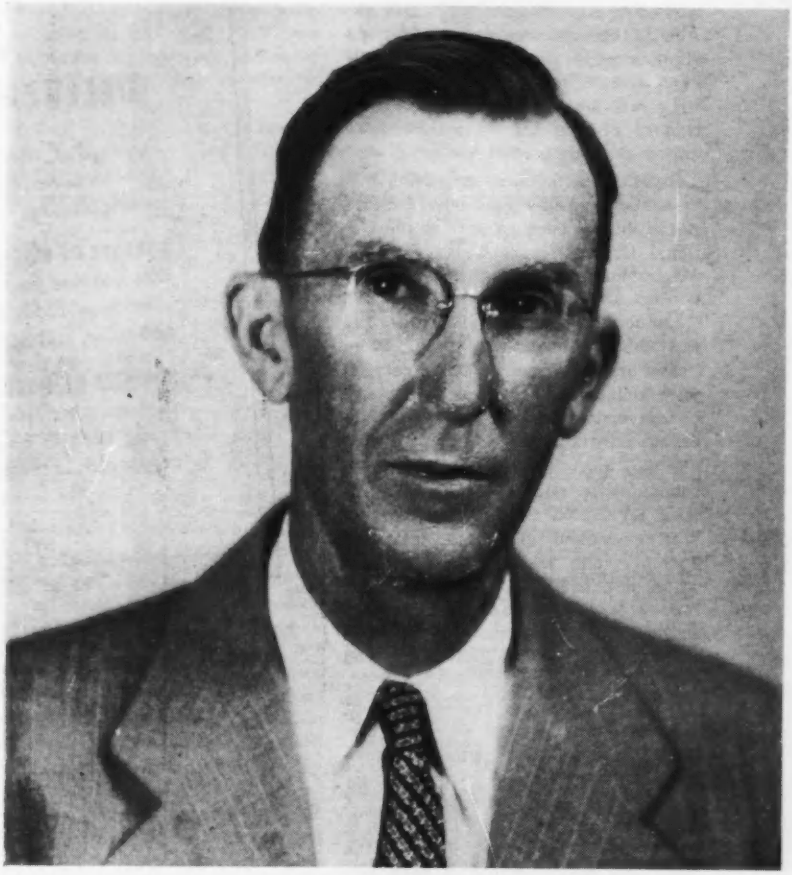

H. G. CLAYTON

Effective May 31, H. G. Clayton steps down as leader of the State's county and home demonstration agents and a staff of specialists at Gainesville and Tallahassee after serving nine years. In all, he has been serving Florida agriculture for thirty-nine years.

VOL. 37 — NO. 6 JUNE, 1956 BARTOW, FLORIDA

Citrus Commission Plans Big Summer Advertising Drive

The Florida Citrus Commission's summer advertising program, beginning June 1st, will see the large state citrus agency concentrating its major effort on the canned and frozen citrus market during the non-productive months.

In June, canned orange juice will be spotlighted with a three-fifths page full color ad in PARADE Sunday newspaper supplements on June 10th, and in AMERICAN WEEKLY Sunday newspaper supplements on June 24th.

The supplement ads will be carried by 81 newspapers throughout the nation with a combined total circulation of 16 million readers.

In addition to supplement advertisement, a major portion of the FCC TV commercials on 111 television stations will be devoted to the promotion of Florida canned orange juice during the month of June.

Retailers throughout the nation will be asked to promote all canned citrus juices during June as part of the National Citrus Merchandising Committee promotion under the theme "Citrus Coolers for Summer Health."

Canned grapefruit juice will get the "big push" during July, while frozen orange concentrate will get major emphasis during August. September advertising will promote the sale of canned grapefruit sections.

Junior page ads in full color are scheduled to appear in the SATURDAY EVENING POST magazine supporting canned grapefruit juice on July 7th, and frozen orange concentrate on August 4th. In August, a four color full page advertisement supporting canned grapefruit sections will appear in BETTER HOMES AND GARDENS.

And, as magazine and supplement ads appear in support of citrus products throughout the summer, television commercials will carry a major part of each month's promotion. A heavy concentration of TV spots in 67 major market areas will extoll the taste and health benefit of each product featured during the summer months.

The FCC this year has arranged its summer schedule so that while one product is being featured during each month, there will also be sustaining advertising on television for the other two products. Because of this,

(Continued on page 19)

GOOD CITRUS FERTILIZERS

CONTAIN

Sul-Po-Mag®

Water-Soluble Double Sulfate of Potash Magnesia
$(K_2SO_4 \cdot 2MgSO_4)$ 22% K_2O—18% MgO

S-P-M

DELIVERS DOUBLE POWER

Sul-Po-Mag, which is most effective as part of a complete fertilizer, supplies *magnesium* and *potash*, both in quick-acting, water-soluble form.

SULFATE OF MAGNESIUM—Here's soluble magnesium that enables your crop to make full use of all the other plant foods. It improves citrus yield, flavor, size and color, and helps keep your groves healthy, too.

SULFATE OF POTASH—A premium form of potash that contains *less* than 2.5% chlorides and can be safely used to boost the yield and quality of any crop which is sensitive to chloride toxicity.

CITRUS fertilizers containing *Sul-Po-Mag* are better fertilizers . . . better balanced and more effective. That's why so many manufacturers of *quality* fertilizers use *Sul-Po-Mag* in their citrus grades. So see your fertilizer field representative now and order your favorite brand in a grade containing *S-P-M* . . . it pays!

VEGETABLES grown on soils low in magnesium and potash respond with vigorous growth and healthy color to fertilizers containing *S-P-M*. *Sul-Po-Mag's* ideal combination of soluble magnesium and low-chloride potash produces larger yields of vegetables with the quality that commands top market prices.

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R. M. Pratt

Citrus Insect Control For June 1956

R. B. Johnson

W. L. THOMPSON,
R. M. PRATT
R. B. JOHNSON*
Florida Citrus Experiment Station, Lake Alfred

W. L. Thompson

Purple scale infestations will be below average in June, but this is the period of the year in which even average infestations are high. Red scale infestations were substantially above average in May and will be fairly high in June. The peak of both red and purple scale infestations will be reached in mid-July. Red scale infestations are expected to be high again in October and November.

Purple mite infestations were extremely high in May. The level in June will depend on how much rain occurs. Rust mite infestations were low in May, but might increase sharply in June. Six-spotted mite infestations have been low and will decline in June. Mealybug infestations will increase in June but will be below average.

SPRAY PROGRAM

The insect control program in any month should be built around the pest which predominates in the individual grove. For example, if red scale is currently the chief problem, the next application should be designed primarily to control scale. This does not mean that any scalicide may be used regardless of accompanying problems, but that the spray formulation should be built around a scalicide, with it, and the added materials if any, selected to take care of other problems also. In June some groves will be heavily infested with purple mite. If that is the chief problem, build your program around a miticide. Other groves will be heavily infested with mealybug while many more will have high populations of red scale. Aim your spray program at the chief pest in your grove!

Scale Control: Where only one scalicide spray is used each year, it is generally preferable to delay the application until July. However, there are some conditions that call for scale control in June. If large acreages are involved, scalicide sprays must be applied early in order to finish the job by fall. Scalicides should also be applied in June where scale populations are already at high levels. These groves are likely to include some that received no dormant or post-bloom scalicide. Such groves should be checked for scale and sprayed if necessary. Where large acreages are involved, the most heavily infested groves should be sprayed first.

Now that we have decided where to spray in June, we are faced with the selection of a scalicide. Parathion, malathion, oil emulsion and the combination of parathion and oil are all good scalicides, but there are several limitations that must be considered before we decide which to use. Oil emulsion is not only a good scalicide, but it is also an excellent miticide. It is, however, somewhat of a shock to the tree and may cause leaf drop or even fruit drop if used on trees in need of water. Oil will also cause a grade-lowering blemish called "oil blotch" if used on oranges, tangerines and Temples when fruit is between 3/4 to 1 ½ inches in diameter. Also, although oil emulsion is excellent for purple mite control, it is poor for rust mite. Therefore, if trees have a good supply of moisture, if fruit is smaller than ½ inch or larger than 1 ½ inches in diameter, and if neither mealybugs nor rust mite are a problem, either 1.3% oil emulsion or 0.7% oil emulsion plus 1 pound of 15% parathion (or the equivalent in other formulations) is recommended where scale and purple mite are a problem. Where oil should not be used, as outlined above, parathion at 1 2/3 pounds of 15% wettable powder or 3 to 5 pounds of 25% malathion plus 5 pounds of wettable sulfur are recommended.

Mealybug Control: Mealybugs often get under the button at the stem-end of the fruit. They also commonly occur between fruit hanging in clusters and under leaves resting against fruit. Tree trunks and branches are also likely places to look for the cottony masses of mealybug eggs.

Although mealybugs are not a general problem, they are numerous in a few groves and will cause fruit drop. Where mealybugs are abundant, parathion at 1 2/3 pounds per 100 gallons should be applied as early in June as possible. The combination of parathion and oil is also effective against mealybug and is particularly desirable where purple mite is also a problem. Parathion is the most effective insecticide against mealybugs, but its effectiveness decreases the later in the season that it is applied. Regardless of timing, only thorough application, including coverage of trunks and limbs as well as leaves, is really effective. Parathion applied for mealybugs will also kill the scale, of course, but don't forget 5 pounds of sulfur per 100 gallons for rust mite and a miticide if purple mites are numerous.

Purple Mite Control: Many grow-

SCALE AND MITE ACTIVITY BY DISTRICTS*

District	Purple Scale	Red Scale	Purple Mite	Rust Mite on leaves
West Coast	5.08	3.57	1.64	1.20
Indian River	3.41	3.52	1.36	.25
Upper East Coast	5.14	2.90	1.85	1.00
Gainesville	2.66	1.17	.33	.50
Orlando	3.83	2.71	2.44	.52
Brooskville	4.42	2.00	2.01	1.44
Ridge	4.81	4.22	2.88	.83
Bartow	4.81	4.18	2.27	2.64
State Average	4.37	3.38	2.12	1.04
Last Year	4.13	2.45	1.57	1.05

* Third week in May. Activity is computed from populations, amount of hatching of scales, and number of groves with increasing or decreasing infestations. Activity is considered high if above 4.0 for purple scale, 3.0 for red scale, and 1.5 for mites.

* Written May 25, 1956. Reports of surveys by Harold Holtsberg, Cocoa; J. W. Davis, Tavares; K. G. Townsend, Tampa; T. B. Hallam, Avon Park; and L. M. Sutton, Lake Alfred.

ers prefer to overlook purple mite during the spring and summer months. This may be the most economical practice if mites remain at low levels and thus do little damage, but it is a mistake if mites become plentiful. Large numbers of purple mite can cause mesophyll collapse and leaf drop in the spring and summer as well as winter.

Purple mite should be no problem where oil is used as a scalicide, but there is nothing in parathion sprays without oil to prevent an increase in purple mite. In such sprays a miticide may be needed. Although the available miticides are far less effective during hot weather than during cool weather, they are certainly better than nothing at all. Either ovotran at 1 pound per 100 gallons or 2/3 pound of 45% aramite per 100 gallons may be used in parathion sprays or applied with wettable sulfur. (Experiments carried out in December of 1954 and February of 1955 showed no difference in mite control between 2 pounds of 15% aramite and 2/3 pound of 45% aramite.) Aramite, however, cannot be used in alkaline solutions such as sprays that contain lime-sulfur, and ovotran should not be used in the same grove more than once a year.

For those who like to experiment, Systox at not less than ½ pint per 100 gallons, although not yet recommended, is suggested as worth a try.

Regardless of the miticide used, only thorough coverage of all foliage will give the best results. Anything less is surely a waste of money.

Rust Mite Control: The best spray for rust mite contains 1 gallon of liquid lime-sulfur and 5 pounds of wettable sulfur per 100 gallons. Parathion for scale or mealybugs and ovotran for purple mite but not aramite may be included in this spray. Where purple mite is an accompanying problem, however, better control of this pest will be obtained if lime-sulfur is left out.

Wettable sulfur at 5 pounds per 100 gallons is enough sulfur for rust mite control where scalicide or miticide sprays are being applied, but 10 pounds is needed if only brushing-type sprays for rust mite alone are planned.

Since oil emulsion is very poor against rust mite and since oil and sulfur should never be mixed, oil sprays need to be either preceded or followed by a sulfur application. If oil cannot be preceded by sulfur, be sure to watch for rust mite after the oil application because they may become numerous very quickly. Remember that at least 3 weeks should intervene between applications of oil and sulfur.

For more detailed information refer to the 1956 "Better Fruit Program" or consult the Citrus Experiment Station at Lake Alfred or Fort Pierce.

Growers And Shippers League Commended

The Growers and Shippers League of Orlando was praised by the Florida Citrus Commission for its successful negotiation of rail freight rate reductions for shippers of Florida concentrates.

FCC members termed the expected annual $570,000 slash in concentrate freight rates as " . . . another example of the thousands of dollars the industry has saved through the expenditure of Citrus Commission funds for the services of the Growers and Shippers League."

The League is retaind by the Commission to handle all matters pertaining to transportation. The FCC, under state law, is permitted to apply up to three percent of its total revenue to transportation matters.

Announcement of the rate reduction on concentrate terminated nearly a year of negotiation by the Citrus Commission through the Growers and Shippers eLague for rate reductions. Similar negotiation is underway for rate reduction for fresh fruit shippers.

Commended by the Citrus Commission for assistance in bringing about the rate reduction was Florida Citrus Mutual and the Florida Canners Association. Commissioners were also unanimous in voicing their appreciation to the Seaboard Air Line Railroad which initiated the action for rate reductions.

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The Citrus Industry
EXCLUSIVE SPECIALIZED CITRUS PUBLICATION
Issued Monthly
Representative of every interest
Representing no special interest

Publication office at Bartow, Florida. Entered as second class matter February 16, 1920, at the post office at Tampa, Florida, under act of March 3, 1879. Entered as second class matter June 19, 1933, at the post office at Bartow, Florida, under act of March 3, 1879.

Medfly Spreads Coast To Coast

Long And Costly Fight Predicted By Experts

Hope that the infestation of the dreaded Mediterranean fruit fly might be confined to the Lower East Coast has been shattered by finding the fly or it's larvae in areas across the State. Hope that the pest might be quickly exterminated also has been all but abandoned. Experts from other sections, long engaged in fighting similar pests, predict that the fight will be long, hard and costly.

As this is written the fly or its larvae has been found from Coast to Coast, from Dade, Broward and Palm Beach counties on the Atlantic to Sarasota county on the Gulf. With the fly definitely discovered in Highlands and Polk counties, the threat to the highly productive citrus section of the Ridge becomes serious. As of today eleven counties are known to be affected, with the expectation that new infestations may be announced at any time.

Quarantine of infested areas, road blocks and spraying of groves have so far failed to arrest the spread of the pest. Spraying by airplane has been brought into service to expedite the work of ground forces. State and Federal funds have been assured to carry on the work of extermination, but at best it is conceded that the work of eradication has assumed gigantic proportions.

Predicts Long Fight

N. O. Berry, expert in fighting the Mexican fruit fly on the Texas border, now working with Federal and State forces here in Florida, says the State must prepare to hire men and spend money for at least three years. Old timers, remembering the fight against the fly in 1929-30, will agree that the Medfly is an illusive and determined insect.

Fruit flies have a habit of hibernating in the ground for long periods, emerging in the Spring to lay eggs.

And tracking small infestations is sometimes rather tricky.

The adult flies evade the traps set for them over the state, and sometimes it isn't until the maggots show up that infestation becomes known.

Traced By Traps

Use of these fly traps has created a widespread misimpression over Florida that the traps are used to kill the flies. Actually, that is not the reason for the traps. The glass jugs are hung across the state in an effort to find out just where the flies are.

It has been a month and a half since a Winter resident of Miami cut open a grapefruit which had been stored in his kitchen and found a dozen or so maggots in it.

The maggots were definitely identified five days later, but the news was kept from the public for a couple of days while the state plant board, charged with pest control in the state's agricultural field, studied the situation.

This Is Different

The current cleanup differs radically from that used in 1929-30.

It started out much the same.

Ed Ayers, the state plant commissioner, ordered his men into the field on April 22 to begin finding out where the flies were. As reports came in, they were plotted on maps.

The plan was to take laborers into the infested areas and pick the fruit as was done in 1929-30. Sprayers were then to go in and douse the trees and plants with malathion and yeast.

The malathion-yeast spray was developed in Hawaii by USDA researchers who said it is more effective than the arsenic sugar spray used in 1929-30.

Malathion is a phosphoric acid-based poison which kills most insects. The yeast attracts the flies to the spray. They nibble and die.

The original plan was followed for about three weeks.

Spraying From Air

On recommendation of the USDA airplanes were brought into service

(Continued on page 13)

Relationship Of Yield To Age Of Trees And Trees Per Acre

ZACH SAVAGE
AGRICULTURAL ECONOMIST
AGRICULTURAL EXPERIMENT STATIONS

AT GULF CITRUS GROWERS INSTITUTE

In some areas where citrus has been grown over a long period of time, some of the trees bear fruit commercially for many seasons. There are a few really old trees in Florida, and some groves have been producing fruit commercially over long periods of time. Many of the original trees have remained in production in some of these old groves. In other old groves most of the original trees have been replaced and younger trees make up the majority of the grove. In most cases replacements became necessary earlier where the trees became crowded with added age and spread of the limbs. During the time that these older groves have been producing fruit, other groves have ceased to exist or all the old trees replaced.

In this study no information was assembled on old groves or old trees that had ceased to be commercially profitable at the time these data were collected. There are no assembled data of adequate volume on the ages of old groves or old trees at the time they ceased to produce fruit commercially. Such information would be useful in many ways, one of which would be in determining the life expectancy of the various varieties of citrus. The Bureau of Internal revenue has recently announced a modification of their allowance for tree depreciation to the extent that higher rates of depreciation may be permitted on groves where claims for such can be substantiated.

There are many variables that enter into this question of the length of the commercial life of a citrus tree. Some of the factors are kind of soil depth of soil, depth to hard pan, variety, rootstock, fertilizer practices, protection from low temperatures, diseases, insects, grove management practices, elevation, and tree spacing. These variables and others combine in various and sundry proportions to lessen or add to the commercial life of trees.

None of the groves on which the Florida Agricultural Extension Service and Experiment Stations have obtained records have ceased to produce fruit commercially due to old age of trees during the past 25 seasons. Many individual trees have died and were replaced. Replacements were not limited to old trees but took place at all ages represented in the sample. Replacements affected the average age of the grove in proportion to the number replaced in combination with age of each tree in the grove. This is true also for Florida citrus as a whole when resets replace older trees.

Orange and grapefruit trees are here considered separately since their growth and fruit yields are somewhat different. However, the general results are similar. In order to get the picture more clearly, data are presented on trees from 5 to 49 years of age from time of setting in the grove. Data on trees 50 years of age and older were not sufficient to establish definite trends.

Orange trees. The accompanying table shows results of orange trees of the sample referred to. This sample includes groves in a dozen counties with 85 percent of them located in Lake, Orange, Polk, and Highlands counties. These groves were on many of the different soils commonly found in the citrus area. For simplification in presentation and to increase the acreage in each group, tree ages were grouped in 5-year intervals. To avoid getting lost in the various setting distances found in these groves, the groves were grouped according to the number of trees set per acre at intervals of 10 trees per acre. This arrangement placed most of the trees in six groups ranging from 40 to 99 trees per acre.

The per-acre yield of young trees is directly proportional to the number of trees set per acre. This holds true until the trees begin to crowd each other. After crowding has developed the bearing and leaf surfaces are lessened per tree, resulting in a gradual reduction in yields. In these orange data all tree groupings in-

(Continued on page 18)

RELATIONSHIP OF NUMBER OF TREES PER ACRE AND YIELD AT VARIOUS AGES, Twelve seasons, 1940 - 52

Age of tree	Number of trees per acre					
	40 - 49:	50 - 59:	60 - 69:	70 - 79:	80 - 89:	90 - 99
(years)	Yield in boxes					
	ORANGE TREES					
5 to 9	64	79	93	107	122	136
10 to 14	111	135	160	184	209	234
15 to 19	151	178	210	242	265	284
20 to 24	194	221	257	280	298	309
25 to 29	242	264	287	310	318	322
30 to 34	294	299	314	332	323	314
35 to 39	348	341	341	350	316	291
40 to 44	404	386	367	359	305	256
45 to 49	462	434	390	355	289	215
	GRAPEFRUIT TREES					
5 to 9	77	95	112	129	146	163
10 to 14	149	182	215	248	275	300
15 to 19	212	246	291	320	340	360
20 to 24	276	299	361	385	400	400
25 to 29	346	368	426	430	400	380
30 to 34	422	440	483	450	400	360
35 to 39	508	514	528	460	380	340
40 to 44	590	600	563	450	360	320
45 to 49	675	642	588	435	350	300

Data from Studies of the Florida Agricultural Extension Service and Experiment Stations, Gainesville, Florida.

Florida's Orange Exports Attract World Attention

By Herb Mosher

(Second of a Series)

In studying the subject of citrus exports, I was fortunate enough to get the views of Dorsey Cott, sales manager for Deerfield Groves, Inc., at Wabasso, after Dorsey had returned from his tour of some leading European markets. Dorsey is a busy man and it was quite some time before it was possible to persuade him to write about his experiences and observations while on this tour. However, his manuscript was well worth waiting for and his observations will be of great interest to the industry.

Now for what Dorsey reports:

European Trip

The question of export markets for Florida citrus had long been a topic of discussion by grower groups and the need for expanded exports seemed a paramount issue. At a meeting of Florida Citrus Mutual it was agreed that further first-hand information would be valuable in making the necessary plans for expansion of the export program.

It was decided that as many as possible sales managers make a trip to the various European markets to gather information. After many changes of plans due to various reasons, the following definitely agreed to make the trip: John Leslie and H. N. Baron, representing Sealdsweet Sales; John A. Hurn, representing Lake-Highlands Co-operative Association; Robt. Carleton and Harley Lester of Plymouth Citrus Growers Association; Martin Hearn, representing Florida Citrus Mutual; D. W. Cott, of Deerfield Groves Company; Gene Turner of Waverly Growers, and Robert Swetman, representing the Swetman Travel Agency. This group assembled at Idlewild Airport on January 7th and was greeted by representatives of Governor Harriman and Mayor Wagner as well as Florida Citrus Mutual local representatives and newspapermen and photographers. Our send-off was well publicized by many photographs taken at the plane's ramp showing the travelers amid Florida fruit.

Nippy Weather

The weather at take-off time was a little nippy for a bunch of "Crackers" but the picture-taking was soon completed and the "Flying Dutchman" of the Royal Dutch Line started on it's journey. It was about one P. M. New York time when we left the airport. The plane made one stop at Gander enrout to Europe, and we got our first taste of real winter. Weather was very cold and snow was deep on the ground at the Gander airport. We spent about a half hour there then departed on the final leg of the journey. The pilot quickly took the big plane to about 19,000 feet where we cruised until we were over the British Isles. We were above the clouds the entire way until we approached Ireland and the impression was of traveling over a deep blanket of snow. The service on the plane was perfect and the trip seemed short although the entire time in the air was about fifteen hours. We could see the lights on the various British Isles as we flew over but it was too dark to distinguish any landmarks.

DORSEY COTT

Arrival At Rotterdam

We arrived at Schliepol airport at Rotterdam on Sunday morning at about 8 A. M. Dutch time and had breakfast after clearing the customs. We were fortunate in having a local representative of the Royal Dutch Lines with us to facilitate our passage through customs. The weather in Holland was very foggy and cold and we left by plane about 11 A. M. in a dense fog which precluded any sightseeing. Arrived Hamburg airport at noon and went to our hotel. The Atlantic Hotel in Hamburg was a very beautiful hotel, very modern although some things were somewhat different from American hotels but nonetheless convenient. Hamburg is a beautiful city although it bore some bombing scars from the war. But the damage had been largely repaired and new buildings had replaced some of the old ones that had met with disaster. The apparent damage was much less than we had expected to see. We were met at the airport by officials from the American Embassy who were on hand throughout our stay to make our visit more pleasant and to assist us in seeing all that we had come to see.

On Monday we went to the docks to see the unloading of citrus fruits from many ports. The warehouse at the docks was very large and had a capacity of around 200,000 boxes of citrus. There were Spanish and Moroccan oranges along with Sicilian lemons and Jaffa and Cypru grapefruit. All of this fruit was very attractive, clean, smooth and bright. The packages were a little on primitive side as compared to the ones to which we are accustomed. Some were bound with bark strips around the ends and most had the labels printed on the ends. Some of the orange boxes were apparently of one and two-fifths capacity rather than one and three-fifths as we use. The grapefruit boxes from Palestine were of larger capacity than ours probably two bushels. Palestine grapefruit is quite similar in appearance and flavor to that grown in Arizona. The color is clear and bright and the skin free from scars and pest damage.

At noon on Monday we met with the officials of the Hamburg Fruit Auction for about an hour when a discussion was held on all phases of the possibilities of exporting Florida citrus to Germany. It was felt that

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25% For Old Groves

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Fertilizer represents an important part in the grower's average acre-crop cost. If you're tempted to skimp on fertilizer quality to save a few dollars, remember that loss of quality and quantity may *cost,* not *save.*

In groves under 10 years old the crop-acre cost averages 19% for fertilizer; in groves over 10 years old it averages 25%. With such a stake in your crop for this one great quality control element, take no chances. Use IDEAL BRANDS with ORGANIC NITROGEN from high-grade sources... brands laboratory-and-field-tested for balanced, continuous feeding.

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Genuine Peruvian Guano is a bird guano collected from the habitat of fish-eating birds, mostly cormorants and boobies, on the coast of Peru. It is a rich source of natural organic nitrogen, phosphoric acid and potash. Also contains a wide variety of essential trace elements. Crop response to Peruvian Guano as a fertilizer is quick, as well as long-lasting. Available again in Ideal Brands.

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although there was a chance to do some business, we had many obstacles to overcome. Our freight rate is almost double that paid by Continental shipping areas and the time required for the transportation of the fruit is much longer from the United States. These factors together with the fact that Germany likes the bright clean fruit and tart flavor of fruit they are now receiving. After this discussion we had lunch in the auction company's restaurant with members of the Hamburg auction.

Toured Hamburg

After lunch we were taken for a tour of the Hamburg port by port authorities. While the weather was very disagreeable, the boat was entirely closed and heated so was very comfortable. We were able to see every part of the port and points of interest were pointed out by the port representatives. This section had been pretty thoroughly bombed during the war and most of the docks, piers and buildings were new and modern. It was a very enjoyable trip and one that would not have been readily available to the average tourist. The harbor was full of ships from all countries and a wide variety of flags was in evidence. This trip consumed the whole of the afternoon and was most enjoyable and instructive.

After the harbor tour the Florida delegation was host to a cocktail party for the Hamburg fruit receivers and jobbers. This was well attended by about one hundred people including Embassy and Department of Agriculture officials and Hamburg newspaper and radio people. The evening was spent in becoming better acquainted with the Hamburg receivers and getting their viewpoint as to possibilities of exports from Florida. Much good was accomplished since we learned a lot of things that had been somewhat hazy in our minds before. After the short social session, we were guests of a few of the members of the Fruchthof auction at dinner. They provided a sumptuous meal lasting for several hours and many courses. The hosts were all that could be asked in their hospitality and the completeness of the arrangements.

Attended Auction

On Tuesday morning we attended the Fruchthof auction and again saw fruit from many countries. We were again impressed with the fine outward appearance of Spanish and Palestine fruits. Saw some Florida oranges at this auction which made us realize that Florida had much to do in order to compete with other sections going into Hamburg. Both

the fruit auction and the Fruchthof auction rooms were very modern and up-to-date. The furnishings were new, clean and attractive. Theatre-type seats were provided for buyers comfort and convenience. On the backs of the seats were folding desks for convenience in writing. The rooms looked more like fine old drawing rooms rather like the drab somewhat soiled and uncomfortable auction rooms in the United States. Each receiver has thirty minutes in which to sell his offerings for the day. At the end of thirty minutes, he must leave the stand and make way for the next dealer. As each completes his thirty minute stint he goes to the end of the line, if he has not finished. Then he can again take the stand to compleet his sale. The sale usually starts about ten to eleven A. M. and continues until finished. There is usually one auction each week at each of the auction companies. One is usually held on Wednesday and the other on Thursday to give all buyers a chance to attend both.

We took a little time off on Tuesday afternoon for sight-seeing and shopping. We were impressed with the apparent prosperity and thrift of the natives of Hamburg. It is a very beautiful city and contains many points of interest. Saw a little snow while in Hamburg but not enough to provide the "crackers" with a novel sight to which many had looked forward. At noon on Tuesday we went to the airport to depart for Rotterdam. Our plane was delayed for about four hours due to a snowstorm in Rotterdam which made landing conditions hazardous. We spent this time at the airport in Hamburg expecting momentarily to hear our plane announced. Finally left at about five P. M. and arrived at Schipol airport which is located about half-way between Rotterdam and Amsterdam. We went through the usual customs inspection, passport stamping, etc., then boarded a bus Rotterdam. The bus took us to the Hague enroute where we transferred to another bus for Rotterdam. Was too dark by this time to see much of the scenery. Arrived at our hotel in Rotterdam about nine P. M. hungry and tired. This was an old hotel with many unique features throughout but the service was very good and the meal excellent. The beds were quite different from those to which we were accustomed. The mattresses were deep and comfortable with an additional small mattress, somewhat wedge-shaped at the

(Continued on page 13)

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Arizona Growers Interested In Budwood Certification

A Talk Before The Yuma Mesa Club, Yuma, Arizona, April 25, 1956

. . . By . . .
GERALD NORMAN,
IN CHARGE OF FLORIDA BUDWOOD CERTIFICATION PROGRAM

I understand that the state of Arizona and you people in particular are considering and are interested in Citrus Budwood Certification for your state. I, of course, am going to talk on the Florida Citrus Budwood Certification Program. I want to tell you of its purpose and scope, of its successes and failures, and of some of its problems. This is an extremely ambitious Program since it is intended to provide Florida growers and nurserymen with sources of budwood that are true to type, free of bud mutation, and free of virus diseases. This is the only Program as far as I know that undertakes to accomplish so much.

Most of you know that because of variations in climate, soil type, and water relationships, Florida grows an unusually large number of citrus varieties on an unusually large number of rootstocks. Perhaps it is this diversity more than any other single thing that differentiates Florida citrus from other areas in the world.

Our principal rootstocks are Rough Lemon, Sour Orange, Cleopatra Mandarin, and Sweet Seedling; but we also have plantings on Citrange, Trifoliate, Sweet Lime, and Rangpur Lime. We grow at least 10 commercially important varieties of sweet oranges, at least 4 important varieties of grapefruit as well as Tangerines, Tangelos, Temples, and Limes.

Since we actually have 30 scion varieties of citrus in our Certification Program you might say that all 30 are commercially important because at least one grower or nurseryman intends to propagate registered progeny and scion trees of one of these varieties. The orange varieties entered for certification in our Budwood Program are Hamlin, Parson Brown, Navel, Pineapple, Jaffa, Enterprise, Sweet Seedling, Mediterranean Sweet, Lue Gim Gong, Valencia and Pope Summer.

The grapefruit varieties in the Program are Duncan, Thompson, Ruby Red, Foster, McCarty, and Marsh. We also have three types of Tangerines under test, Dancy, Murcott, and Clementine; and three Tangelos, Orlando, Seminole and Minneola. We are also testing Bearss and Tahiti Limes, Temples and King Oranges. This large number of citrus varieties together with the many possible combinations of rootstocks explains to a certain extent why our virus disease problems are generally more complex than in other areas. Each one of these scion-rootstock combinations reacting in its own individual fashion to the presence of a given virus has complicated our work with these diseases. It is because of this situation that our Budwood Program, of necessity, had to be more comprehensive than similar Certification Programs in other citrus producing areas.

The Florida Program

The Florida Program therefore requires that registered parent trees be free of Exocortis, Blight, Declines, Psorosis in all its forms, Xyloporosis, Tristeza, Stubborn Disease, or any other recognizable bud transmissible disease.

Initiation of the Florida Budwood Program was sponsored by the Production Manager's Association, one of the most active and progressive organizations on the Florida citrus scene. Perhaps more than any other group these men saw the need for a program to improve bud sources. Many of them are responsible for the production of thousands of acres of citrus. Over the years their records demonstrated that consistent losses were being incurred in some plantings from the presence of virus diseases. This was particularly true where a high percentage of the trees were infected with the eruptive type of Psorosis. Under Florida conditions, this loss of production was not necessarily spectacular with any large acreage of trees dying in a few weeks or a few months. On the contrary, in most cases it was gradual shifting from profitable productivity to increasingly low yields over a period of years. In some plantings this loss might amount to as little as one percent a year and in others might be very high. But in either case, there were losses that involved the cost of removal of a dead or dying tree; the cost and care of the replacement tree, plus the loss of production from the original tree. It was obvious that something had to be done and the answer to this problem appeared to be the certification of budwood.

A committee was appointed to formulate policies for a Budwood Program, and since the citrus industry, through the Florida Horticultural Society, had requested this Program, leading nurserymen, growers, processors, marketing specialists, and all other branches of the industry were asked to attend these meetings and were invited to enter into the discussions.

From the beginning of these meetings, it was apparent that before any actual progress could be made toward matters of policy, it would be necessary to make a decision as to which of two methods of operation should be used. One of these methods, favored by many of the nurserymen participating, was to have the state make selections of the best budwood from the best trees we could locate, test it for virus infection, and if found free, distribute this budwood to our growers. Certainly, from the viewpoint of those charged with the administration of the Program, this would have been the simpler and the easier way.

The alternative proposal — to set

up a policy under which growers entered the Program on a voluntary basis and submitted candidate trees from their own properties for testing — had the apparent advantage of eventually supplying each interested grower with certified budwood on his own property and under his own care and control. This was the method that was finally adopted and the Statement of Policy was written accordingly.

Must Use Both Methods

After three years of testing, our viewpoint is different. We now realize that because of the high level of virus infection present in some varities of our citrus, we must eventually use both of these methods to attain our objectivies, and, that while the method of operation finally selected was not wholly satisfactory, its use was more than justified by the information we have obtained and in spite of the amount of work it has involved. This mass testing of all kinds and types and varieties of trees from all over our citrus area has also served to supply us with much needed information as to just what our status is in regard to virus infection in our citrus plantings as a whole.

One of the great values to come out of grower participation in our search for desirable budwood is that we now have 57 partners in this work, growers and nurserymen who have demonstrated their belief in this Program by participation.

Another invaluable outgrowth of the type of Program selected is that the whole Florida citrus industry has become virus-conscious, and, that growers working with us in the selection of their own candidate trees now more than ever appreciate the need for this Program. They are better informed as to the destructiveness of these diseases, better able to recognize them from field symptoms and therefore, better able to eliminate them from their uncertified budwood. As a result of their participation in this Program, they are also much more aware of the difficulties we are facing; of the time and effort necessary to attain our objectives, and of the magnitude of the work we have undertaken.

This Program, by its very existence, has served as a constant reminder to all our citrus growers of the losses being incurred in their own plantings because of virus infection and that they now have an opportunity to help us do something about their own losses.

202 Parent Trees Tested

Most important of all is the fact that we now have two hundred and two (202) parent trees that have been tested and found free of the very destructive virus, Psorosis. Because of the high standards we have set for ourselves, we are apt to lose sight of this very considerable achievement. For nearly twenty years, the State of California has operated a Certification Program which had for its sole objective the finding of Psorosis-free budwood and it is only in the past few months that California authorities have considered the revision and expanson of the California Program because Florida's Budwood Program has demonstrated to them what a Citrus Budwood Program can accomplish. We must not lose sight of the fact that adequate supplies of Psorosis-free budwood is a great step forward in the general improvement of our Florida citrus industry. We have every reason to believe that as the years of testing continue, new sources of Psorosis-free budwood will be developed until adequate supplies are available throughout the state.

Today our certification test plot represents nearly nine hundred (900) candidate trees from 18 Florida counties. This nursery has become an extremely valuable source of material to our research workers because they can secure from it tested budwood of many different varieties of citrus infected with a single virus or budwood infected with several combinations of viruses. As more tests are completed and these trees begin to produce fruit and seed they will become even more valuable for their use in studies of virus separation, of virus complexes, and possible seed transmission. Even our unbudded nucellar seedling rootstocks which will eventually be used as test trees are presently being used by entomologists as sources of virus free aphids in studies of virus transmission by insects, and it goes without saying that they are also using our test trees known to be infected with specific viruses in the same manner.

Our test plot also represents a wealth of purely statistical information since these nine hundred (900) trees can be presumed to be a representative cross section of the best commercial citrus trees in the state.

This method of operation also gave us an opportunity to observe the practical accuracy and dependability of our pathological literature and research findings which in many cases were worked out in the laboratory, or under controlled conditions, when applied on a large scale by non-tech-

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nical personnel under Florida field conditions.

From the literature we understand that there were 3 types of Psorosis bark symptoms common to most varieties of citrus. These were the eruptive, the concave gum, and the blind pocket types. We believe now there is at least one other, the one we call limb distortion. The main limbs of these trees often appear triangular with the upper surface presenting a sharp edge. They may have bulges or recesses or long flat areas and generally have an appearance of angularity, distortion, and eccentric growth.

We don't know that this condition is solely Psorosis and since it seems to occur most commonly on Valencias and Navels it might be Psorosis in combination with a form of bud variation. In one old Navel planting, trees showing this type of limb distortion have Tristeza as well as Psorosis. But regardless of whatever else they may have, these trees do have Psorosis on the basis of foliage symptoms.

After 3 years of testing we also feel that we have a somewhat better understanding of the general incidence and distribution of Xyloporosis in Florida citrus. We have every reason to believe that at least 67% of the trees in even our best groves are infected with this virus and that symptom expression ranges from symptomless carriers through trees on stocks showing a mild reaction to some stock-scion combinations showing very severe reaction.

We also know that buds from these Xyloporosis infected trees when budded on Orlando Tangelo stocks will in many cases lead to typical bud union symptoms of Xyloporosis within 2½ years and in some cases have actually led to very marked symptoms within 13 months. We know that literally thousands of acres of our very best and most profitable groves are infected with this virus without any apparent reduction of yield because in most cases they consist of tolerant stock-scion combinations. While this particular virus appears to have little effect on yield on most commercial combinations, we can presume that we would be better off without it. Furthermore, these trees can not be registered because the Statement of Policy governing the Budwood Program states specifically that certified parent trees must be virus free. We can presume also that without this virus our yields from these same apparently healthy trees might be somewhat higher than at present. Experience also indicates that these trees may be losing some cold resistance from the presence of Xyloporosis. This virus may also shorten the life of the tree and perhaps reduces yields after the trees are past the age of maturity.

I spoke a few minutes ago of how it now seemed necessary to adopt a second or supplementary method of operation in our Certification work. We believe that the method of grower submission of candidate trees should be continued but also that our search for virus free trees must be enlarged and expanded to include trees other than those submitted by participants in the Program, with special emphasis on existing seedlings and nucellar strains. The Plant Board recently requested and has now been given authority to test outstanding trees that have not been entered in the Program. It has also become apparent that we need to do more than test existing trees. We need an active program to develop virus-free strains of our more important commercial varieties. In order to show you why I think this is necessary, here are some figures regarding the trees taken into the Program during our first year of operation and which we have now had under test long enough for fairly accurate knowledge of their status in regard to virus infection, although the period of testing has not been long enough to reveal all the difficulties with which the parent trees may be affected.

There were 317 of these original first year parent tree selections. 7 of these trees showed early symptoms of virus diseases and were immediately dropped from the Program and dug out of the test plot, leaving a balance of 310 trees from our first year selections. Only 50 of these 310 first year trees are still under test as potential sources of budwood. All the rest, 260, have been dropped for cause. Here are the reasons. Even after very careful screening during the first flush inspection of the candidate parent trees in the field, 36 trees or 11½ of the total were later dropped for Psorosis. 16 trees or 5% were dropped for Tristeza. 138 or 44% of the remaining trees now have definite symptoms of Xyloporosis either on the parent or the nursery test trees, and an additional 21 trees are indicating the presence of Xyloporosis. 45 trees or 14.5% were dropped for bud variation giving us a total of 77% of all the first year's trees that have been dropped. Many of the trees originally dropped for Tristeza, Psorosis, and Bud Variation are now known to have been infected with Xyloporosis.

Figures Don't Tell All

While this overall figure for trees entered in the first year is not very encouraging, these figures actually do not tell all of the story. Of the original selections, 89 trees were of the late seedless varieties, Valencia, Lue Gim Gong, and Pope Summer. With one year remaining for completion of the Xyloporosis test, we have only 5 trees in this group, 3 Valencias and 2 Lue Gim Gongs that may possibly survive the Xyloporosis indexing, and only one that appears likely to survive. From the first year's selections all of the trees of the Temple variety have been dropped because of virus infection and there is only one surviving Parson Brown. To date, we do have 8 Hamlins, 10 Pineapples, 1 Sweet Seedling, 7 Duncan, 3 Thompson, 4 Marsh, 5 Ruby Red, 3 Tangelos, and 4 Tangerines surviving from the first year's selections that appear to be completely virus free and may eventually be registered without restrictions.

In view of the fact that the late seedless varieties have been the backbone of our citrus economy for the past several years and are becoming even more important because of our increasing emphasis on frozen concentrate, it seems necessary that we take immediate steps to secure desirable bud sources of these varieties as well as to effect a general reappraisal of all those varieties carrying a high level of virus infection. Therefore, it seems that if we are to have completely virus free strains of the Valencia types in any quantity, the state itself must secure them, either by finding trees not yet entered in the Budwood Program; or by propagation of new strains, or by importation of new strains, and that the state must then undertake the distribution of these strains to our growers after thorough testing and continue this testing as long as these trees are used as sources of budwood. Actually, in addition to the first 317 trees entered in 1953, we have screened for selection some 800 additional trees; and have accepted and started testing 612 of them. However, we have no reason to believe that the trend already established by the first year's group will be changed in any way, and it seems that Valencia and Navel budwood from existing sources that is completely virus free will be very rare.

We feel that the testing and certification of our seed sources is just as important as the certification of budwood and we have now been grant-

ed authorization to test seed sources. We intend to test seed source trees for the presence of viruses just as we are now testing budwood sources. We certainly intend to continue our attempts to find virus free bud sources and virus free seed sources. We also realize now that once we have found such trees, their testing and observation must be continued indefinitely to see that they remain virus free as long as they are used as sources of budwood.

The one most important thing that we have learned about certification of citrus budwood is that any Program of this type must be flexible enough to provide for rapid changes in its operating procedure. That Program can then take immediate advantage of any new information affecting certification and thus avoid becoming static and regulation-bound to the point where it is soon outmoded. To accomplish most for its participants, a Certification Program must be not only aware of the continuous developments in virus research but sufficiently fluid to use new information as it develops and take full advantage of the very important work now being done by all our research agencies.

FLORIDA'S ORANGE EXPORTS ATTRACT WORLD ATTENTION

(Continued from page 9)

head of the bed giving the impression of sleeping in a hammock. One unique feature which caused some little embarrassment was the series of buttons like light switches just inside the door. It was a natural habit to enter the door and push one of the buttons to switch on the lights. When the first did not operate the lights we tried another then another and were soon surprised to see the arrival of the maid, the tailer, the bellboy and others who were summoned by these bells. We quickly learned thereafter to locate the light switches and used the others for their proper functions only.

On Wednesday we visited the auction in Rotterdam. The auction is located in a large, modern building which is very conveniently arranged for it's purpose. The display rooms are on the ground floor which is very light and bright due to the fact that two of the walls are solid glass from floor to ceiling. Here we saw citrus fruits from Spain, Morocco, Mexico, Palestine, Florida and California. All samples were attractively displayed in rows to make inspection easier. The auction room itself was along the same standards as those in Hamburg. The interior was clean and bright and contained every modern convenience for the buyers. The seats were heavily upholstered and comfortable with a small writing desk on the back of each seat. These desks folded out of the way when not in use, and when up provided a place for writing. As in Germany, one auction sale is held each week in each auction company usually on Wednesday. Here, also, each buyer has one half hour to sell his offerings and after which he must retire and make way for the next seller. At the end of the sale, those who did not finish on their first appearance were permitted a second half-hour to complete. We found the Dutch buyers in the auction rooms and elsewhere to be very high-type men.

LONG AND COSTLY FIGHT PREDICTED BY EXPERTS

(Continued from page 5)

to accelerate the work of spraying and now much of this work is being done from the air.

While growers are hopeful, they are not as optimistic as they were a month ago, and are inclined to accept the situation as one which will require much time, hard labor, and the expenditure of much money to bring about complete eradication of the pest.

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Handling And Packaging Trends In Fresh Fruit Operations

T. R. PERRY
MINUTE MAID CORP.
AT MEETING AMERICAN SOCIETY
MECHANICAL ENGINEERS,
WINTER HAVEN

The present day packing houses for processing and shipping fresh fruit has come a long way since the machinery was driven by manpower on hand cranks and shipped by steamboat to market. Compared to some of the other automized industries of today, much of the packing and handling of fresh fruit is still done by hand labor and brute strength.

To follow briefly through the procedures used in packing houses today, the fruit is unloaded in field boxes from trucks or trailers in stacks of four by hand trucks. The fruit is stored in de-greening rooms, as necessary, and moved by fork trucks in stacks of eight field boxes to an automatic dumping machine. The fruit is washed, polished, waxed, and graded. It is then sized into packing bins and packed into boxes or bags by hand packers.

Among the reasons for hand packing is the large variety of different packages used. This is, after all, a sales operation and fresh fruit is purchased largely on eye appeal by both the wholesale buyers and the ultimate market, the housewife. Care is necessary in packing to offer a good eye appealing package. The demand varies from place to place and customer to customer. Unfortunately, from a mechanization standpoint, these demands must be met and satisfied. Some of the packages are:

1. 1 1/5ths wire bound or bruce box.
2. 1 3/5ths fibre board box.
3. 4/5ths or ½ box either wire bound or fibre board.
4. No. 5, No. 8, and No. 10 mesh bags.
5. Express or export box.

To further complicate matters from a mechanization standpoint, fruit is largely sold by size and count in the various boxes, rather than by weight. Certain buyers for different areas incline towards certain sizes of fruit. For example, the buyer may order 200 boxes (1 3/5ths size) No. 70 grapefruit, meaning that 70 of these grapefruit would fill a 1 3/5ths box. To fill this order, the packing house may have to run from 700-1000 boxes of grapefruit to get 200 packed boxes of No. 70's.

Few, if any, packing houses can afford the complete specialization of selling only one type crop in one type container. A single device which packs into only one type container places the seller in an undesirable position. To mechanize it is necessary to install sufficient equipment to provide any demands. As packers are usually guaranteed a weekly minimum, it is not feasible to invest in equipment that will do only part of the job. The overhead on hand packers continues even though they are not working steadily during the week.

In addition to the number of various packs used, many of the smaller wholesalers order split loads, part oranges, part grapefruit, part tangerines, and even a portion in mesh bags. When using hand packers, it is a relatively simple procedure to switch from one package to another, although considerable time is lost in switching from one variety to another.

On a hand operation, the labor is largely seasonal and, if a freeze or other disaster occurs, it is a relatively simple matter to close the operation and stop a large portion of the overhead.

The marketing of fresh citrus fruit is a hazardous business. The price varies widely from season to season and from week to week in one season. The available crop varies so that sound long range financing is very difficult. This tends to discourage large financial investments in automatic equipment which must be paid for whether it is operated at a profit or not.

There are an equal number of sound reasons to encourage mechanization. A good supply of purely seasonal labor is hard to obtain. Many leave for more permanent jobs. As industrialization increases, much of this labor supply will no longer be available . . . this is one of the man reasons for California's push to mechanize packing operations. In some areas, seasonal labor has disappeared.

To give some idea of the costs of present day packing house operations, a portion of a cost study prepared by staff members of the University of Florida has been included. This is a breakdown on the costs of packing and selling a 1 3/5ths bu. wire bound box of Florida oranges. These are average figures from 42 representative packing houses throughout the State and offer a very close approximation of a typical operation. The price of the oranges themselves is not included, inasmuch as the variation is too wide to have any real meaning in a cost study.

Material	37.29c
Labor:	
Receive, truck, dump	1.03c
Crate making and labeling	3.01c
Foreman, graders, and box closers	4.68c
Wrap and pack	6.16c
Truck, check, load	4.26c
Payroll taxes and insurance	1.45c
Total Labor	20.59c
Other direct operating	5.16c
Indirect operating	3.32c
Total Packing	66.36c
Administrative	4.47c
Selling	6.38c
Other Items	11.42c
Total Packing and Selling	88.63c

Of these charges, the single highest is material . . . this is taken care of by competition among package manufacturers. The next highest single charge is hand packing. This gives an obvious spot to begin as the problems in packing can be coped with mechanically in this industry as in many other industries. In March of 1955 a mechanical packer was installed in a lemon packing house in California. This unit is called a volume pack. It consists of a weight and shaking station which tends to settle the fruit into the package. When used with an automatic gluing and closing machine, substantial savings are available.

A short run of film will demonstrate the action of the fruit in the container. The vibration causes the fruit to settle and rotate at the same time.

The present day volume pack combines several operations formerly done in more than one step. Sizing of the fruit is done on a drop roll sizer. The rolls are in two layers, the lower layer proceeding in a straight line while the upper layer slowly climbs on a track, making the spaces pro-

gressively larger. The fruit drops into baffled channels according to size and is guided to loading stations. These loading stations are combination weighing and shaking stations. The box is vibrated all the time it is being filled. When the boxes reach a pre-determined weight, a small flap in the fruit discharge chute springs up to stop the flow of fruit into the box. The box moves out to a common conveyor and through an automatic closing machine. An empty moves into position and activates a trip which allows the cycle to repeat itself. In this particular operation, the boxes are made up behind the volume pack and fed under it on conveyor belts. Other variations are possible where the layout warrants changes such as side loading into the boxes or overhead box lofts.

The volume pack represents a definite step in the right direction. It still requires hand finishing in re-arranging the top layer of fruit to present a neat appearance. For the same reason, the boxes are inverted as they are loaded into the cars for shipping. Inasmuch as the fruit will settle somewhat en route, the boxes do not appear to be slack at the market when they are turned right side up and opened. The volume pack has worked very well on lemons and California oranges. A volume pack unit has been installed at the Polk Packing Association to determine the adaptability of the unit for use with Florida citrus fruit. Some difficulty is expected with fruit larger than 170 size oranges. It is expected that this unit will give the necessary experience and background and indicate any necessary change for handling Florida citrus.

To move to a slightly different problem, the 5, 8, and 10 pound mesh bags must be handled mechanically if the remainder of the packing is mechanical. In a typical bagging operation the bag is hung on a wire frame beside the bin and the fruit is packed by hand into the bag. Hand packing in bags, due to more units and more handling in smaller containers, is higher than packing into boxes. This averages 9.9c to 11.5c on an equivalent 1 3/5ths bushel basis.

One of the difficultties encountered in bagging is the variation in the weight of the fruit. In the early part of the season, due to the thickness of the peel, it is difficult to get eight pounds of grapefruit into an 8 lb. bag. In the latter part of the season as the peel becomes thinner and the fruit contains more juice, it is necessary to add one or more extra grapefruit to fill the bag, and the weight may run as high as 9¼ lbs. to 9½ lbs. The size of the bag is fixed by State law, and it is more or less understood that the bag must be full and cannot weigh less than 8 lbs.

Mechanical bagging is successful in many operations and can be used on citrus fruit. The double aging unit is capable of 400 bags—min—unit, or about 36 boxes—hr—unit, using an 8 lb. bag as a basis. The bags are hung on a spring loaded knobs below the discharge chute and the unit is started with a button. Oranges are brought from the bin in the background, up the roller conveyor, and discharged into the bag. The bag hangers are on one end of a balance beam, and when a pre-set weight is reached, a solenoid is activated which stops the roll conveyor. The bag is released by hand and dropped onto the trough conveyor below where it is either stitched or stapled and sent to the car. Another bag is put in place and the cycle is repeated. This is a little over six bags on each unit per minute. The bags are loaded onto a double deck railroad car or a truck. Shipping mesh bags results in considerable fruit damage. The container offers no protection for the contents and the handling costs are very high. Upon arrival at the market in mesh bags, crushed or spoiled fruit is rather difficult to handle. The bag must be opened and, often, other fruit in the bag has been spoiled by contact and the bag appearance may be ruined, making re-packing necessary.

To offset this, a number of large consumers in northern cities have installed bagging equipment similar to that shown and buy in bulk. The equipment can be used on citrus, potatoes, onions, and other produce sold in 5 lb., 8 lb. or 10 lb. bags. This allows a number of advantages to the buyer. The buyer's costs in bagging equipment to do his own bagging are no higher than the handling costs to unload a bag onto hand tracks and re-load into distributing trucks. The fruit is purchased already sized, graded, waxed and polished in bulk loads on ice. As the fruit is unloaded in bulk, it can be graded to eliminate any shipping damage. The buyer can then use belt or chain loading into distributors' trucks and eliminate the hand handling formerly necessary.

Another point in handling citrus is the pre-cooling operation. This is not always done on oranges and grapefruit, but is considered essential in shipping tangerines and Temple oranges. The most common method is to hand truck packed boxes into cooling rooms usually held at around 38°-42°F. The fruit is usually held for eight hours, or longer, at this temperature for cooling. Fruit from de-greening rooms is very close to 85°F. This necessitates double handling, inasmuch as the fruit must be picked up from the cooling room and hand trucked to railroad cars, or trucks, for loading. Due to the close packing used in railroad cars and trucks, the fruit is not loaded in stacks but is again unloaded from the hand trucks and stacked for shipping. At Fairville, Florida, a system was installed with a loading dock 500 ft. long with railroad accommodations on both sides which allows car spots for eleven cars for both loading and pre-cooling. Three truck loading spots are kept open. A chain belt runs the full length of the dock and is fed by belts directly from the box packing location. Once the boxes are packed and started on the line, the next handling is by a turn-man into the car. Of course, it is necessary to have a place to put each box that comes through so that several cars must be loaded at once. While this requires careful scheduling, it eliminates unnecessary handling. Once the cars are loaded, the pre-cooling units are brought up on an overhead tram rail. These units are fed by an overhead brine system containing propylene glycol at 0°F. The brine is cooled in a centrally located refrigerator room and pumped the length of the dock. the pre-cooling units are

(Continued on page 18)

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Reports Of Our Field Men . . .

SOUTH POLK, HIGHLANDS, HARDEE, DeSOTO AND SARASOTA COUNTIES
C. R. Wingfield

Some of this area was blessed with very good rains during early May while others received light rains. It was a great relief but with the water table so very low it has not lasted long and we will be faced with irrigation again in a few days if we do not have more rain.

There has been a very heavy fruit drop that has worried some growers. Irrigated groves appear to be holding a good crop with Valencia oranges being possibly light except on young trees. Early and Midseason appear good but are still dropping. Non-irrigated groves have lost a great deal of foliage as well as fruit but have put on new growth and bloom but it is questionable how much fruit it will hold. Movement of Valencias have been very active and crops of old fruit are becoming scarce.

Since the rains the summer fertilizer application has moved at a rapid pace. Careful consideration should be given to each grove because of the varied conditions that have existed since last feeding.

EAST HILLSBOROUGH AND PASCO COUNTIES
E. A. McCartney

Conditions have changed since the April report, and mostly for the better in the citrus industry. We have had rain and the groves look good, prices are fair for Valencias but as usual grapefruit growers are having a hard time moving their fruit at a fair price.

There is a fair crop of new fruit set in areas that were not too badly affected by the drought and where groves were adequately irrigated. It is regrettable, however, that several growers in this section lost up to fifty percent of their fruit from lack of moisture.

We are busy fertilizing now, in most cases putting on a full application ahead of the expected June rains. Melon growers have had it rough. They have just started to ship but will be in full production by the time this is in print. Vegetable growers are having their busy season at this time, especially tomato and pepper producers, but are getting about one-half the price received this time last year for no better quality.

The new grading regulations adopted this year have created considerable dissatisfaction among the growers who patronize the Plant City market.

WEST HILLSBOROUGH AND PINELLAS COUNTIES
J. A. Hoffman

Although we had several nice rains the early part of May, soil moisture is very low at this time. Early May showers were very scattered throughout Pinellas County and most growers are irrigating in that area. West Hillsborough and Pasco had considerable more rain and can get by another week or so without suffering.

The summer application of fertilizer got underway the first of May and in some places will be delayed for lack of moisture.

Watermelon growers commenced shipping melons the 15th of May in this area. Most growers had trouble with the first cutting, but by May 21st they will be in full swing.

SOUTH HILLSBOROUGH AND MANATEE COUNTIES
J. D. Toll

Rainfall in this territory during this past month varied from less than ½ inch to 6 inches. At this time (May 15th) many groves are being irrigated again. We have had a lot of dry weather this spring and growers will welcome the rainy season.

We are in the middle of the summer application of citrus fertilizer and most groves will have been fertilized by June 15th.

Young groves have shown an excellent growth this past month.

Fruit has been moving steadily and bringing very good prices.

Watermelons are being harvested now. Many growers will have late melons this year because of the bad weather earlier this spring.

The tomato crop is being harvested now. In most cases growers will have their crops picked by June 1st.

With the coming of June and the rainy season it will be an excellent time for the cattlemen to put an application of that "Good Lyons Fertilizer" on their pastures.

HIGHLANDS AND POLK COUNTIES
J. K. Enzor, Jr., & R. E. Lassiter, Jr.

We have received some good rains in this area since the last writing. We have not received any rainfall however since the last of the second week in May. Quite a bit of fruit drop has been noticed in this area since these rains but in many cases where growers have been upset by this drop, we notice quite a good crop remaining on the trees. Due to the dry weather many of our trees, especially those not being irrigated, have been left with very sparce foliage. Warm nights which we have been experiencing in the last week or so have been quite conducive to good growth and many of our growers in this area have started applying their summer fertilizer application.

Rust mite infestation has not been too severe since the dry weather. However, there is beginning to be an increase in the rust mite population.

Six-spotted mite infestation although not nearly as severe as last year's infestation seems to be on the decrease at this time.

Where growers were not able to apply a copper oil due to the dry conditions this spring it will be especially important to apply the summer scale insecticides.

NORTH CENTRAL FLORIDA
V. E. Bourland

We had rain last week, (this is being written May 15th), but it came down so hard most of it got away, and we need some now. The ground isn't wet by any means and the lakes are still low. Groves are looking very good, and most of them have a good crop yet, although the ground is covered with little oranges. You can't speak yet for the crop. Some trees are blooming again, and we expect lots of bloom as it has been so dry.

Melon growers are smiling and it looks now that they are going to make lots of melons. We hope they have a price that will keep them smiling.

Pastures are looking improved since the rain, and cattle are looking good.

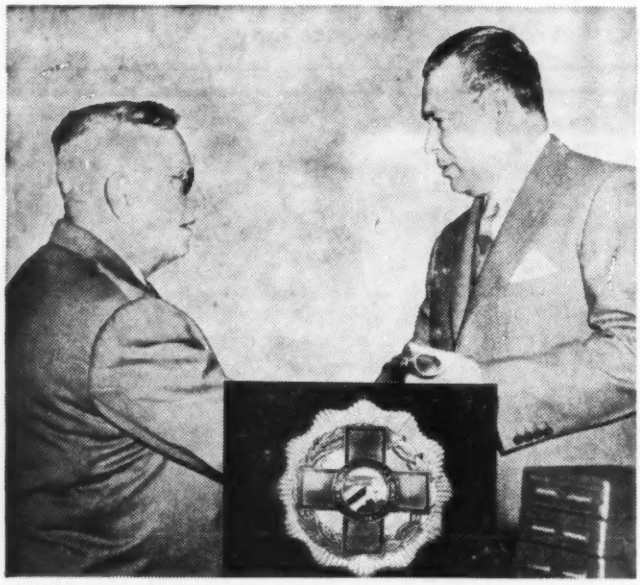
Uncle Bill Says:

Most folks has a bit of gambling spirit in their make-up . . . but it's a plumb rare bird who can make a livin' out of bettin' on the ponies, playing the slot machines er shootin' craps . . . 'n most folks realize it, so while they like the thrill of gamblin' most of us has figgered out some other way of providin' grits 'n gravy fer ourselves and our families.

It's bin said that farmers generally speakin' is among the biggest gamblers they is 'cause every time they plant a crop er plan to produce a crop of citrus fruit they've got to anticipate havin' a struggle with wind, rain, cold, drought, and pests of a heap of different kinds . . . still 'n all in spite of all these things the growers of our state produces mighty big crops of the finest fruit 'n vegetables that is raised anywhere.

They ain't no grower who jist sits around and waits to see how bad these things is goin' to hurt him . . . practically every grower in Florida is purty well up on the cultural practices. He knows how to combat bugs and pests of all kinds. He knows that the healthier a tree is the more chance it has of standin' cold or drought or other hazards, so he keeps his trees well fed and sprayed and prunes and cultivates and does a lot of other things to insure raisin' the best possible crops, be his major crop fruit or vegetables.

Based on our own experience we figger that the best possible safety measure against any hazard is to feed our crops with Lyons Fertilizers . . . they've got a slogan which says that you can Produce Maximum Crops of Finest Quality with Lyons Fertilizers . . . and along with a lot of other Florida growers we know from experience that this statement is absolutely true.



AWARD—Luther L. Chandler [left] Goulds, Chairman of the Florida Fruit & Vegetable Association's Competition and Marketing Agreement Committee, here pictured with Cuban Pres. Fulgencio Batista in presentation ceremonies at Havana, has been awarded Cuba's Grade Order of Merit Agricultural and Industrial. Mr. Chandler's efforts over a period of years in effecting a better understanding and a closer relationship between agricultural interests of Cuba and Florida resulting in an upgrading in agricultural standards were cited in this recognition by the Cuban Govt. Headquarters of the Association are in Orlando. [Photo of the medal is inset.]

HANDLING AND PACKAGING TRENDS IN FRESH FRUIT OPERATIONS

(Continued from page 15)

divided into two sections. The upper section contains two fans and two 5 H.P. motors and the lower section contains a radiator type heat exchanger. The upper section with the fan is arranged so that after it is placed in the railroad car it can be jacked up about 12 inches to allow the radiator section to slip into the same opening. This prevents unloading the doorway to install the unit. The units are supported on stands placed in the two doorways of the railroad cars with an angle track between to carry the load of the units. The radiator section is connected to the brine system through two flexible hoses with quick opening valves. Due to the high humidity which is encountered in Florida, these units are set for automatic defrosting every half hour. The unit cuts off for from seven to ten minutes during which time the fans are cycled twice. When first installed, the fans did not cut off during this cycle, and it was found that the water on the coils thawed all right but that the fan suction did not allow it to flow to the drains. When the units are in place, a section of canvas is unrolled about 2/3rds of the way down the car in both directions on top of the packed fruit to force the air to circulate through the entire car. Otherwise, there would be a tendency to freeze the fruit nearest the unit. It has been found that about 3½ hours are required for pre-cooling a car so that the temperature of the fruit ranges between 38° and 42°F. This has the added advantage in that the car itself is cooled to this temperature so that the ice added to the bunkers of the car lasts to New York without refilling. Longer shipments usually require a second icing en route. These units work equally well on truck loads, although a slightly different type is used for convenience.

As in many other industries, there are operating costs in fresh fruit handling and packaging which can be turned into profit with the outlay of capital money. The push to reduce costs through improved materials handling is continuing in all industries and new ideas and methods are beingbeing introduced today which will allow faster and better handling in fresh fruit.

RELATIONSHIP OF YIELD TO AGE OF TREES AND TREES PER ACRE

(Continued from page 6)

creased in yield up to the 25 to 29 age group. The 90 to 99 tree-per-acre group reached its highest yield in this age group. Older age groups of these tree numbers decreased in yield. The 80 to 89 trees-per-acre group reached its highest yield at 30 to 34 years of age and the 70 to 79 tree group at 40 to 44 years. Presumably, the 60 to 69 tree group about reached its highest at 45 to 49 years, although this cannot be proven from these data. At just what age the two groups with the fewest trees per acre — 40 to 49 and 50 to 59 — would have reached their highest yields, cannot be determined from these data.

Grapefruit trees. The general picture for grapefruit was similar to that of oranges. Grapefruit yields were higher and usually had larger trees. At the same setting distances, grapefruit trees became crowded at younger ages than oranges. Presumably, both grapefruit and oranges would continue to increase in yields to older ages than 50 years with 40 to 49 trees per acre than in any of the other groups shown. Just how old either oranges or grapefruit would be in this group before showing decreased yields cannot be determined from these data.

These data indicate that yields of oranges and grapefruit are related to age of tree and the number of trees set per acre. Some of the difficulties encountered in some of our older groves no doubt were brought about or intensified by trees not having sufficient space. Hedging is one way of alleviating some of the bad effects of crowded trees and no doubt would be more effective if done to prevent

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crowding than if done several years after the limbs had interlocked. There was not enough hedging on the groves of these data to affect the results here presented. Double setting with the removal of alternate trees at the proper time is another means of relieving or postponing of trees crowding each other. However, a chief hazard to this method is the lack of sufficient intestinal fortitude by the management to remove the trees at the proper time.

A table of returns above operating costs per acre on these groves over the same period, presents a somewhat similar picture as the table presents on yields.

CITRUS COMMISSION PLANS BIG SUMMER ADVERTISING

(Continued from page 2)

retailers are being urged to feature all major processed citrus products throughout the summer season.

Total cost of the FCC summer advertising program during July, August and September is estimated at $380,764. Members of the Commission have voiced the hope that the planned summer program will stimulate consumer demand for processed citrus products, so that low Florida processed inventories will be reflected in healthy market conditions when the new season opens in November.

NEW DEPARTMENTS IN HORTICULTURE AND FOODS ARE PLANNED

Division of the horticulture department of the University of Florida College of Agriculture into three departments and establishment of a new department of food technology and nutrition, which will include the work now being done in the department of home economics, has been approved by the State Board of Control.

The changes will go into effect July 1 and were recommended by Provost for Agriculture Willard M. Fifield, and President J. Wayne Reitz.

Provost Fifield says that staff members now in horticulture and home economics in the three fields will be assigned to the four new departments.

"It is felt that the new setup will be less cumbersome and more effective in rendering teaching, research and extension service to Florida's vast horticultural and food processing industries," the provost said.

Spuds Johnson says you'd better wear shoes if you want to leave your footprints on the sands of time.

CLUB SHORT COURSE JUNE 11-15 TO DRAW SOME 450 4-H BOYS

An estimated 450 boys representing 60 counties are expected to attend the 37th annual 4-H Club Boys' Short Course at the University of Florida June 11-15, according to W. W. Brown, boys' club agent with the Agricultural Extension Service.

Examinations will be held for an $800 scholarship offered by the Southern Dolomite Company and five $100 scholarships given by the State Bankers' Association.

The course will conclude Thursday night, June 14.

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